[HOSPITAL / HEALTH AUTHORITY NAME]

ENVIRONMENTAL AND EXPOSURE EMERGENCIES PATHWAY

Protocol 36: Rapid Rescue and Resuscitation, Temperature Control, Decontamination, Electrical and Lightning Care, Diving-Emergency Management, Transfer, and Safe Disposition

DRAFT FOR EMERGENCY MEDICINE, ANAESTHESIA / CRITICAL CARE, TRAUMA / SURGERY, PAEDIATRICS, TOXICOLOGY / POISON SERVICES, PUBLIC HEALTH, OCCUPATIONAL HEALTH, EMS / FIRE / RESCUE, DIVING MEDICINE / HYPERBARIC SERVICES, RADIATION SAFETY, NURSING, PHARMACY, AND TRANSFER SERVICES

STATUS: This is a draft clinical-governance document. It must be adapted to local rescue, decontamination, cooling and rewarming equipment, oxygen and ventilatory capability, laboratory access, emergency blood and medication stocks, poison-centre arrangements, radiation-safety support, hyperbaric referral pathways, transport constraints, and specialist availability. Medication doses, cooling endpoints, rewarming methods, recompression indications, radiation countermeasures, and discharge observation periods require local approval before implementation.

IMMEDIATE SAFETY RULE: Protect rescuers and staff before contact. Remove the patient from ongoing danger without creating another casualty. Start ABCDE and time-critical treatment immediately: ventilations and CPR after drowning, rapid active cooling for suspected heat stroke, gentle handling and rewarming for hypothermia, scene isolation and decontamination for hazardous substances, standard resuscitation after electrical or lightning injury, and 100% oxygen with urgent hyperbaric consultation for suspected decompression illness or arterial gas embolism.

Document control	Details
Document owner	Emergency Department / Medical Services Directorate / Nursing Services / Clinical Governance
Clinical leads	Emergency Medicine; Anaesthesia / Critical Care; Trauma / Surgery; Paediatrics; Toxicology / Poison Service; Public Health; Occupational Health; EMS / Fire / Rescue; Diving Medicine / Hyperbaric Service; Radiation Safety
Applies to	Adults, children, pregnant patients, older adults, workers, travellers, divers, and vulnerable persons with drowning, heat illness, hypothermia, cold injury, electrical or lightning injury, hazardous chemical or inhalational exposure, radiation contamination / exposure, decompression illness, gas embolism, or acute altitude illness
Interfaces	Protocol 17 Altered Mental Status; Protocol 26 Dehydration and Electrolytes; Protocol 28 AKI; Protocol 29 Poisoning; Protocol 30 Anaphylaxis; Protocol 31 Major Trauma; Protocol 32 Head / Spinal Injury; Protocol 35 Burns and Wounds; Protocol 48 Airway; Protocol 56 Disaster Response; local hazardous-materials, radiation, diving and transfer plans
Version / status	Draft 1.0 for local multidisciplinary validation
Review cycle	After any serious incident, guideline change, equipment or service change, environmental disaster, or at least every 2 years
Required approval	Emergency Department; Anaesthesia / ICU; Trauma / Surgery; Paediatrics; Toxicology; Public Health; Occupational Health; EMS / Rescue; Hyperbaric / Diving Medicine; Radiation Safety; Pharmacy; Nursing; Clinical Governance

1. Purpose

To provide a standardized emergency-department pathway for rapid rescue coordination, physiologic stabilization, temperature control, decontamination, injury recognition, targeted investigation, specialist escalation, transfer, observation, and safe disposition for environmental and exposure emergencies while preventing secondary contamination, delayed organ injury, avoidable disability, and death.

2. Scope

This protocol applies from pre-alert or first contact through discharge, observation, admission, critical care, specialist transfer, rehabilitation referral, or death. It covers drowning and submersion, heat illness and heat stroke, accidental hypothermia, frostbite and non-freezing cold injury, electrical and lightning injury, hazardous chemical and inhalational exposure, radiological contamination or exposure, decompression illness and arterial gas embolism, and acute altitude illness. It complements rather than replaces trauma, toxicology, burn, airway, infection-control, disaster, occupational-health, safeguarding, and specialty-specific pathways.

3. Core policy statements

- Scene and staff safety precede patient contact. Do not enter water, energized areas, confined spaces, chemically contaminated zones, unstable structures, or radiation-control zones without trained rescue personnel and appropriate personal protective equipment.
- Physiologic threats take priority over exact exposure identification. Treat airway obstruction, respiratory failure, hypoxaemia, shock, cardiac arrest, seizures, dysrhythmia, hypoglycaemia and severe agitation while simultaneously controlling temperature or contamination.
- Use a structured ABCDE assessment with repeated reassessment. Environmental injury evolves: an initially stable patient may later develop pulmonary oedema, cerebral injury, rhabdomyolysis, hepatic failure, coagulopathy, arrhythmia, renal injury, tissue necrosis or neurological deterioration.
- Cooling, rewarming, decontamination, oxygen therapy and transfer are treatments, not administrative tasks. Record start time, method, response, interruptions and endpoint.
- Use exposure-specific specialist advice early. Poison centres, burn services, diving / hyperbaric physicians, radiation-safety officers, public health, occupational health, coast guard / rescue and tertiary critical-care services should be contacted before deterioration when indicated.
- Normal initial tests do not exclude serious disease. Clinical evolution, serial examination and functional assessment determine observation and disposition.
- No patient is discharged until the dangerous exposure has ended, vital signs and mental state are stable, delayed complications have been considered, mobility and oral intake are adequate where relevant, supervision is reliable, and written return precautions and follow-up are provided.

4. Definitions and severity framework

Term	Operational definition
Drowning	The process of experiencing respiratory impairment from submersion or immersion in liquid. Outcome may be fatal or non-fatal. Avoid obsolete terms such as “near drowning,” “dry drowning,” or “secondary drowning.”
Heat stroke	Acute central-nervous-system dysfunction caused by heat exposure, usually with marked hyperthermia. Do not delay cooling while waiting for a numerical temperature threshold.
Accidental hypothermia	Unintentional core temperature below 35 C. Clinical stage and cardiovascular stability are as important as the measured temperature.
Frostbite	Freezing injury of tissue. Deep injury may threaten limb viability and can evolve after rewarming.
Non-freezing cold injury	Cold, wet exposure causing neurovascular tissue injury without freezing, including trench foot and immersion foot.
Electrical injury	Tissue, cardiac, neurological or traumatic injury from electrical current or arc exposure. High voltage is commonly defined as at least 1,000 V.
Lightning injury	Multisystem injury from direct strike, side flash, ground current or contact voltage; may cause simultaneous cardiac and respiratory arrest.
Hazardous-material exposure	Contact with a chemical, gas, vapour, aerosol, powder, liquid or contaminated object capable of injuring the patient or secondarily contaminating responders and facilities.
Radiation exposure	Irradiation without radioactive material on or in the patient. Exposure alone does not make the patient radioactive.
Radioactive contamination	Radioactive material on skin, clothing, wounds or within the body, with potential spread to people and surfaces.
Decompression illness	Umbrella term for decompression sickness and arterial gas embolism following a change in ambient pressure.
Acute altitude illness	Acute mountain sickness, high-altitude cerebral oedema or high-altitude pulmonary oedema following ascent to altitude.

5. Roles and accountability

Role	Minimum responsibility
Triage / receiving nurse	Recognize exposure red flags; prevent contaminated entry; activate resuscitation, decontamination or trauma pathways; record exposure time and first temperature; initiate oxygen, monitoring and first aid within scope.
ED clinician	Lead ABCDE, diagnose the exposure syndrome, order immediate cooling / rewarming / decontamination, identify trauma and toxicology overlap, consult specialists, define monitoring and disposition.
Resuscitation nurse	Coordinate monitoring, vascular access, temperature measurement, medication, fluid, sample timing, urine output, device checks, and time-stamped reassessment.
EMS / fire / rescue liaison	Provide scene hazards, duration, rescue details, water / chemical / electrical source, bystander care, number exposed, decontamination performed and ongoing public-safety risk.
Anaesthesia / ICU	Support advanced airway, ventilation, haemodynamic rescue, severe temperature injury, refractory dysrhythmia, multiorgan failure and critical transport.
Poison / HazMat / radiation / hyperbaric specialist	Provide agent- or exposure-specific treatment, decontamination, antidote, dosimetry, recompression and transfer advice; document the advice and contact time.
Transfer coordinator	Secure accepting clinician, destination capability, safe mode and altitude of transport, oxygen / warming / cooling continuity, escorts, documentation and contingency plans.
Clinical governance	Maintain equipment, drills, interagency contacts, medication stocks, audit, incident review and guideline updates.

6. Pre-alert, preparation, and triage

Pre-alert question	Why it matters
What happened and when?	Defines elapsed exposure, urgency of cooling / rewarming / recompression, and likelihood of delayed injury.
Is the patient contaminated or the scene still unsafe?	Determines outside decontamination, PPE, isolation, ventilation and facility-protection requirements.
Was there cardiac arrest, rescue breathing, CPR, loss of consciousness or seizure?	Triggers resuscitation readiness, airway planning, cardiac monitoring, trauma evaluation and higher-level disposition.
What was the environment?	Water type / temperature, ambient heat or cold, enclosed space, electrical voltage, chemical product, radiation source, dive profile or altitude.
How many patients?	May require incident command, reverse triage for lightning, mass decontamination, surge, public health and disaster activation.
What treatment has started?	Ventilation, oxygen, cooling, rewarming, decontamination, antidote, fluids and transport conditions must continue without interruption.
What specialist resource is likely required?	Early activation of ICU, trauma, burn, poison, radiation, public health, hyperbaric or retrieval services prevents avoidable delay.

DO NOT BRING A CONTAMINATED PATIENT DIRECTLY INTO THE MAIN ED unless immediate lifesaving care cannot safely wait. Activate the local hazardous-materials plan, establish hot / warm / cold zones, use appropriate PPE, and decontaminate before entry whenever feasible.

7. The first 10 minutes

1. Confirm scene and staff safety. Identify contamination, electrical hazard, confined-space risk, unstable rescue environment and need for PPE or decontamination.

2. Call for senior ED support and activate the relevant pathway: resuscitation, major trauma, decontamination, heat-stroke cooling, severe-hypothermia / ECLS referral, poison response, radiation plan or hyperbaric consultation.

3. Airway: open and clear the airway, suction visible material, protect cervical spine only when trauma risk exists, and prepare early controlled intubation when airway protection or oxygenation is failing.

4. Breathing: give high-concentration oxygen when hypoxaemia, drowning, smoke / inhalational exposure, severe electrical injury or decompression illness is suspected. Assist ventilation promptly; obtain capnography after advanced airway placement.

5. Circulation: attach ECG / defibrillator pads, control haemorrhage, establish IV / IO access, treat shock, obtain glucose and temperature, and begin exposure-specific cooling or rewarming without delaying resuscitation.

6. Disability: document GCS / AVPU, pupils, seizure, focal deficit, glucose and serial mental state. Consider hypoxia, hyperthermia, hypothermia, toxic exposure, trauma and gas embolism.

7. Exposure / environment: remove wet or contaminated clothing, inspect the whole body, prevent further heat loss or heat gain, identify burns / wounds / frostbite / barotrauma, and preserve evidence or product information safely.

8. Reassess every intervention. Record time to first ventilation, CPR, defibrillation, oxygen, cooling, rewarming, decontamination and specialist contact.

8. General assessment and investigations

8.1 Focused history

Domain	Minimum questions
Exposure chronology	Exact time, duration, rescue time, first symptoms, treatment started, interruptions, transport conditions and change since the event.
Environment	Fresh / salt / contaminated water; ambient temperature and humidity; wet / windy exposure; enclosed space; chemical name / label / SDS; voltage / current path; lightning location; radiation source; dive profile; altitude and ascent rate.
Physiologic impact	Apnoea, coughing, aspiration, dyspnoea, chest pain, palpitations, syncope, seizure, confusion, weakness, visual / hearing symptoms, pain, numbness, urine colour and urine output.
Trauma overlap	Fall, diving impact, boat / vehicle injury, blast, head or spinal injury, crush, entrapment, penetrating injury and non-accidental injury.
Host factors	Age, weight, pregnancy, cardiovascular / pulmonary / renal / liver disease, diabetes, epilepsy, medications, alcohol / drugs, anticoagulants, implanted devices, disability and prior diving / altitude illness.
Operational context	Number exposed, coworker / family symptoms, rescuers affected, public-health risk, occupational reporting, reliable supervision, transport and access to follow-up.

8.2 Examination and targeted tests

- Record serial temperature using the most accurate available core method for the syndrome. Rectal temperature is preferred in suspected heat stroke; use low-reading core thermometry for hypothermia. Peripheral readings may mislead.
- Perform full respiratory, cardiovascular, neurological, skin, eye, ear, abdominal, limb and trauma examination. Document distal neurovascular status and functional ability.
- Common tests include glucose, blood gas / lactate, electrolytes, renal and liver function, CK, full blood count, coagulation / fibrinogen, urinalysis, ECG and pregnancy test. Add troponin, toxicology, carboxyhaemoglobin / methaemoglobin, cultures or specific exposure assays only when clinically indicated.
- Imaging is syndrome-directed: chest radiograph / lung ultrasound for respiratory injury, CT for trauma or focal neurological findings, vascular imaging for ischemic injury, and specialist imaging for barotrauma or gas embolism. Normal imaging does not exclude decompression illness.
- Use serial observations and tests when delayed injury is possible. Heat stroke, rhabdomyolysis, hepatic injury, coagulopathy, pulmonary complications, renal injury and deep cold injury may worsen after apparent initial improvement.

9. Drowning and submersion injury

9.1 Rescue and resuscitation principles

- Remove the person from the water only when rescuers can do so safely. Trained rescuers may provide in-water ventilations when feasible; untrained rescuers should prioritize safe extraction and emergency activation.
- After removal, assess breathing and circulation rapidly. Drowning arrest is primarily hypoxic: start CPR with rescue breaths and chest compressions. Do not delay ventilation while attempting to expel water.

- Suction visible material when it obstructs ventilation. Do not routinely use abdominal thrusts, chest compression or postural drainage to remove aspirated water.
- Apply the AED / defibrillator as soon as available after CPR has started. Dry the chest sufficiently for pad adhesion and move away from pooled water.
- Use spinal motion restriction only when the mechanism suggests trauma, such as diving, collision, fall, intoxication or focal neurological deficit. Routine immobilization delays ventilation and is not indicated for every drowning.
- If hypothermia is present, integrate the severe-hypothermia pathway and consider ECLS-capable transfer for refractory arrest or cardiovascular instability.

9.2 Emergency-department care

Problem	Operational response
Hypoxaemia / respiratory distress	Give oxygen and titrate after reliable oximetry is obtained. Consider CPAP / non-invasive ventilation in an alert, cooperative patient with preserved airway; intubate for refractory hypoxaemia, fatigue, reduced consciousness or inability to protect the airway.
Ventilation	Use lung-protective ventilation and PEEP after intubation. Avoid excessive tidal volume or pressure. Treat bronchospasm when present.
Shock	Assess for hypoxia, hypothermia, trauma, arrhythmia and myocardial dysfunction. Give judicious isotonic fluid when hypovolaemic and use vasoactive support for persistent shock.
Temperature	Remove wet clothing, dry and warm the patient. Treat clinically significant hypothermia according to Section 11.
Neurological injury	Correct hypoxia, hypotension, hypoglycaemia, hyperthermia and seizures. Evaluate trauma and post-arrest brain injury; avoid premature prognostication.
Infection	Do not give prophylactic antibiotics routinely. Consider treatment after grossly contaminated / sewage exposure, aspiration of high-risk material, or clinical infection, with microbiology advice.
Steroids	Do not use corticosteroids routinely for drowning-related lung injury.
Salt versus fresh water	Management is based on physiology, not water salinity. Do not delay respiratory support for speculative electrolyte differences.

9.3 Observation and disposition after drowning

- Admit or transfer patients with cardiac arrest, assisted ventilation, persistent oxygen requirement, abnormal mental status, respiratory distress, abnormal lung findings, haemodynamic instability, significant hypothermia, associated trauma or concerning comorbidity.
- Observe symptomatic patients and those with abnormal oxygen saturation, respiratory examination, mental state or exertional tolerance. Use a locally validated observation duration and discharge tool; routine chest radiography alone should not determine disposition.
- Discharge only when the patient remains asymptomatic, has normal age-appropriate vital signs and oxygenation on room air, normal or improving examination, no significant trauma or safeguarding concern, reliable adult supervision, and written instructions to return for breathlessness, worsening cough, fever, confusion, chest pain, cyanosis or reduced activity.
- Provide water-safety prevention advice and consider safeguarding, substance-use, mental-health or occupational referral according to the circumstances.

10. Heat illness and heat stroke

10.1 Recognition and classification

Syndrome	Typical features and response
Heat cramps / exercise-associated muscle cramps	Painful muscle spasms without systemic CNS dysfunction. Stop exertion, move to a cool environment, replace oral fluid and sodium as clinically appropriate, and evaluate alternative causes.
Heat syncope	Brief collapse related to vasodilation / volume depletion. Supine positioning, cooling, oral or IV fluid when indicated, ECG and assessment for cardiac / neurological causes.

Syndrome	Typical features and response
Heat exhaustion	Weakness, headache, nausea, dizziness, tachycardia and dehydration without persistent central-neurological dysfunction attributable to heat stroke. Cool, rehydrate, check electrolytes and reassess before discharge.
Heat stroke	Altered behaviour, confusion, seizure, coma or other CNS dysfunction in the context of heat exposure, often with core temperature above 40 C. Begin immediate active cooling and organ support; do not wait for laboratory confirmation or a specific temperature threshold.
Exercise-associated hyponatraemia	Headache, nausea, confusion or seizure after excessive hypotonic intake. Check sodium urgently; avoid reflex large-volume hypotonic fluid and treat severe symptoms according to the hyponatraemia pathway.

SUSPECTED HEAT STROKE IS A COOLING EMERGENCY: obtain rectal temperature when feasible, but do not delay cooling in a patient with heat exposure and altered mental status. Cool first, transport second when safe and operationally possible.

10.2 Heat-stroke treatment

1. Move to a cool area, remove excess clothing and equipment, initiate ABCDE, check glucose and begin continuous ECG and core-temperature monitoring.
2. Use whole-body cold- or ice-water immersion when practical, with continuous airway access, monitoring and staff assigned to patient support. A tarp-assisted cooling method is an alternative when a tub is unavailable.
3. When immersion is not feasible, combine evaporative and convective cooling, ice packs to high-flow areas, cold wet sheets and active circulation of water. Do not rely on small ice packs alone for severe heat stroke.
4. Aim for rapid cooling, generally at least 0.15 C per minute, and stop active cooling near 38.5 to 39 C to reduce overshoot hypothermia; follow local endpoint policy.
5. Treat seizures, severe shivering or dangerous agitation with an appropriate benzodiazepine. Avoid physical restraint that increases heat production whenever possible.
6. Give isotonic IV fluid guided by perfusion and sodium status. Avoid fluid overload and do not assume every hyperthermic patient is volume depleted.
7. Do not use antipyretics. Dantrolene is not indicated for environmental heat stroke unless malignant hyperthermia is the actual diagnosis.
8. Identify and treat renal injury, rhabdomyolysis, hepatic injury, hypoglycaemia, electrolyte disturbance, coagulopathy / DIC, myocardial injury and acute lung injury. Repeat tests because organ failure may be delayed.

10.3 Disposition

- Heat stroke requires admission, usually to a monitored or critical-care setting. Transfer when ICU, renal replacement, advanced liver support, invasive monitoring or specialist care is unavailable.
- Heat exhaustion may be discharged only after symptoms resolve, temperature normalizes, cognition and gait are normal, oral intake is adequate, laboratory abnormalities are absent or corrected, and a safe cooling / hydration plan is available.
- Provide written advice on rest, gradual return to exertion, medication and comorbidity review, acclimatization and prevention. Occupational and sports-medicine review may be required before return to hazardous work or competition.

11. Accidental hypothermia

11.1 Recognition, staging and initial care

Stage / finding	Clinical approach
Mild: roughly 35 to 32 C	Conscious with shivering usually present. Remove wet clothing, dry, insulate, provide warm environment, warm sweet oral fluids if fully alert and not at aspiration risk, and active external warming.
Moderate: roughly 32 to 28 C	Reduced consciousness and decreasing shivering. Handle gently, keep horizontal, monitor continuously, use active external and minimally invasive rewarming, and prepare for arrhythmia / airway deterioration.
Severe: below roughly 28 C or cardiovascular instability	High risk of ventricular dysrhythmia and arrest. Use low-reading core temperature, gentle handling, advanced airway as needed, warmed oxygen / fluids, early ECLS-capable consultation and urgent transfer.

Stage / finding	Clinical approach
Hypothermic cardiac arrest	Start full resuscitation unless there is an unequivocal lethal injury or other locally approved futility criterion. Continue rewarming and use the current hypothermia-resuscitation algorithm; prioritize ECLS rewarming when available.
Temperature unavailable	Use consciousness, shivering, muscle rigidity, breathing and cardiovascular stability to guide staging. Do not delay care while seeking an exact temperature.

- Prevent afterdrop and rescue collapse: handle gently, avoid unnecessary limb movement, keep the patient horizontal, remove wet clothing by cutting when needed, insulate the whole body and apply heat mainly to the trunk.
- Do not rub, massage or vigorously warm cold extremities. Avoid walking a moderately or severely hypothermic patient.
- Use warmed humidified oxygen when available and warmed isotonic IV fluids for required resuscitation. Warmed fluid alone is insufficient as definitive rewarming.
- Check glucose, ECG, electrolytes, blood gas, renal function, CK, coagulation and trauma / toxicology causes. Interpret potassium and other tests in context; seek expert advice before declaring futility.
- Measure core temperature with a low-reading device. Oesophageal temperature is preferred in an intubated patient when available; peripheral, infrared or standard tympanic readings may be inaccurate.

11.2 Rewarming and ECLS escalation

Method	Use and cautions
Passive external rewarming	Warm environment, dry insulation and head covering for mild, stable hypothermia with effective shivering.
Active external rewarming	Forced-air warming, heating pads / blankets and warm packs to trunk for moderate or severe hypothermia. Protect skin and avoid circumferential constriction or burns.
Minimally invasive internal rewarming	Warmed humidified oxygen and warmed IV fluids as adjuncts. Consider bladder / gastric / peritoneal or thoracic methods only under approved specialist protocols.
Extracorporeal rewarming	Preferred for hypothermic cardiac arrest when available and considered for severe hypothermia with persistent hypotension, ventricular dysrhythmia, core temperature below about 28 C or failure of conventional rewarming.
Transfer decision	Contact the ECLS / retrieval centre early. Use a validated tool such as the HOPE score when available, but do not delay transfer or resuscitation while calculating it.

12. Frostbite and non-freezing cold injury

Condition	Emergency-department management
Frostbite before thawing	Treat hypothermia and life threats first. Remove jewelry and wet clothing, protect from pressure, and do not thaw if there is a meaningful risk of refreezing during evacuation or transfer.
Rapid rewarming	When refreezing is no longer possible, immerse the affected part in circulating water at approximately 37 to 39 C until tissue is soft and colour / perfusion improves, usually 15 to 30 minutes. Provide strong analgesia.
Prohibited actions	Do not rub, massage, apply snow, use direct dry heat, allow walking on thawed feet unless unavoidable for safety, or break blisters without an approved wound plan.
After thawing	Elevate, apply loose sterile bulky dressings, separate digits, protect blisters, give tetanus prophylaxis as indicated, and manage hydration and pain. Aloe vera / ibuprofen may be used only under the approved local pathway.
Deep / proximal frostbite	Urgently consult burn, vascular or hand specialists. Consider time-sensitive iloprost or thrombolysis only through a specialist protocol with imaging, contraindication assessment and transfer planning.

Condition	Emergency-department management
Surgery	Avoid early amputation except for uncontrolled sepsis, wet gangrene, compartment syndrome or another urgent indication. Demarcation may take weeks.
Non-freezing cold injury	Rewarm gradually in a warm environment, avoid rapid hot-water immersion, elevate and dry the limb, treat pain, assess neurovascular status and infection, and arrange follow-up because neuropathic symptoms may persist.

13. Electrical injury

13.1 Immediate care

- Ensure the electrical source is isolated before contact. High-voltage scenes, downed power lines and industrial equipment require utility / fire-rescue control.
- For cardiac arrest, use standard high-quality CPR and rapid defibrillation. Treat trauma from falls or blast simultaneously.
- Document voltage when known, AC or DC, duration, wet environment, current path, loss of consciousness, tetany, fall, chest pain, palpitations and pregnancy.
- Inspect the entire body for entry / exit wounds, arc burns, deep tissue injury, compartment syndrome, fractures, dislocations, spinal injury, ocular / ear injury and neurovascular deficit. Small skin wounds can hide extensive internal injury.
- Obtain a 12-lead ECG in clinically significant electrical exposure. Add continuous monitoring, troponin and echocardiography according to symptoms, ECG abnormality, cardiac arrest and suspected myocardial injury, not as indiscriminate screening.
- Check CK, renal function, electrolytes and urine for pigment when high voltage, prolonged contact, muscle pain, deep burns or compartment syndrome is suspected. Treat rhabdomyolysis according to Protocol 28.

13.2 Monitoring and disposition

Finding	Disposition principle
Cardiac arrest, dysrhythmia, abnormal ECG, syncope, chest pain or haemodynamic instability	Admit to monitored care; involve cardiology / ICU as indicated.
High voltage at least 1,000 V, significant arc injury or deep burn	Burn / trauma / surgical consultation and admission or specialist transfer.
Neurological deficit, compartment syndrome, vascular compromise, major trauma or rhabdomyolysis	Urgent specialty care, serial neurovascular assessment and admission.
Pregnancy	Lower threshold for obstetric assessment and fetal monitoring according to gestational age and local policy.
Asymptomatic low-voltage exposure with normal examination and ECG	May be discharged after an appropriate local observation period when there is no loss of consciousness, concerning current path, significant burn, trauma, pregnancy or social risk, with written return precautions.

14. Lightning injury

- Once the scene is safe, the patient does not retain an electrical charge and may be touched. Avoid ongoing storm exposure and use standard lightning-safety procedures.
- In a multiple-casualty lightning event, use reverse triage: apparently apnoeic or pulseless patients may have a favourable response to immediate ventilation and resuscitation and should receive priority when resources permit.
- Start ventilation, CPR and defibrillation according to standard resuscitation. Respiratory arrest may persist after spontaneous cardiac activity returns; continue ventilatory support.
- Assess for blunt trauma, cervical injury, burns, tympanic-membrane rupture, cataract / ocular injury, hearing loss, autonomic instability, seizures, confusion and transient limb paralysis (keraunoparalysis). Reassess pulses and neurological findings serially.
- Obtain ECG and targeted tests. Admit patients with loss of consciousness, abnormal ECG, cardiac symptoms, persistent neurological findings, significant burns / trauma, pregnancy, rhabdomyolysis or unreliable follow-up.
- Provide follow-up for delayed neurological, cognitive, auditory, visual and psychological sequelae even when the initial examination normalizes.

15. Hazardous chemical and inhalational exposure

15.1 Facility protection and decontamination

1. Activate the local HazMat / chemical incident plan and establish incident command. Identify hot, warm and cold zones and control entry.

2. Use agent-appropriate PPE. Do not rely on a surgical mask or routine gloves for an unknown volatile or highly toxic chemical.

3. Provide immediate lifesaving airway, ventilation, haemorrhage and antidote care when it can be done safely, while preventing staff contamination.

4. Remove clothing, shoes, jewelry and personal items; double-bag, label and secure them. Clothing removal alone can remove most external contamination.

5. For dry powders, gently brush or blot away material before water unless agent-specific guidance advises otherwise. For liquids, blot / absorb before irrigation when feasible.

6. Irrigate exposed skin with copious tepid water and mild soap when appropriate. Avoid aggressive scrubbing, high-pressure spray, chemical neutralization and hypothermia. Some reactive chemicals require product-specific methods.

7. Irrigate chemical eye exposures immediately and continuously; follow Protocol 35 and obtain urgent ophthalmology advice.

8. Consult poison control / chemical experts and use the product label, safety data sheet and authoritative emergency database. Document agent, concentration, route, duration, PPE, decontamination method and responder exposure.

15.2 Clinical syndromes and treatment priorities

Exposure pattern	Key priorities
Irritant gas / smoke	Fresh air, oxygen, bronchodilator for bronchospasm, early airway planning for oedema, chest monitoring and delayed pulmonary-injury observation. Consider cyanide / carbon monoxide pathways when relevant.
Asphyxiant	Immediate oxygen and ventilation; identify simple versus cellular asphyxiants and follow poison-centre antidote advice. Pulse oximetry may be misleading in carbon monoxide or methaemoglobinaemia.
Cholinergic pesticide / nerve agent	Decontaminate with appropriate PPE, suction secretions, ventilate, give atropine and oxime according to Protocol 29 and poison advice, and prevent secondary contamination.
Vesicant / corrosive	Immediate decontamination, airway and eye assessment, burn consultation, analgesia and delayed pulmonary / skin monitoring.
Hydrogen fluoride / fluoride compounds	Treat as systemic toxicity risk: ECG and calcium / magnesium monitoring, decontamination, approved calcium therapy and urgent poison / burn consultation.
Confined-space exposure	Do not assume a single gas. Consider oxygen deficiency, carbon monoxide, hydrogen sulfide, cyanide and trauma; rescuers require supplied-air protection.
Unknown cluster	Treat as a potential public-health / deliberate-release event. Isolate, decontaminate, preserve samples / evidence appropriately and notify HazMat, public health and security through the incident plan.

16. Radiological contamination and exposure

- Distinguish irradiation from contamination. A person exposed to external radiation without radioactive material on or in the body poses no radiation hazard to staff.
- Do not delay lifesaving care for decontamination. Use universal precautions, minimize the number of staff, cover wounds and contain runoff / waste according to the radiation plan.
- Contact the radiation-safety officer, public-health authority and national emergency service early. Record source, time, distance, shielding, symptoms and dosimeter data when available.
- Remove clothing and personal items carefully, bag and label them; this may remove most external contamination. Survey with appropriate instruments when available.
- Decontaminate skin gently with lukewarm water and mild soap, working from less contaminated to more contaminated areas and preventing spread to wounds or the face. Do not abrade skin or delay urgent surgery.
- Irrigate contaminated wounds and cover them. Internal contamination, significant whole-body dose and need for decorporation agents require specialist assessment; do not administer potassium iodide or other countermeasures without authorized guidance.
- Assess for acute radiation syndrome after substantial whole-body exposure: early nausea / vomiting, lymphocyte decline, skin erythema and marrow injury. Obtain serial full blood counts with differential and specialist-directed dosimetry.
- Protect privacy and provide clear risk communication. Radiation fear can create additional casualties and must be addressed with accurate information.

17. Diving emergencies, decompression illness, and gas embolism

17.1 Recognition

Presentation	Consider
Neurological symptoms after ascent	Arterial gas embolism or neurological decompression sickness: confusion, seizure, focal weakness, sensory change, ataxia, visual disturbance, bladder dysfunction or loss of consciousness.
Pain / skin symptoms	Deep joint or limb pain, mottled rash, pruritus or swelling may represent decompression sickness.
Respiratory / cardiovascular symptoms	Dyspnoea, chest pain, cough, shock, pulmonary oedema, pneumothorax, mediastinal air or severe decompression illness.
Ear / sinus / dental symptoms	Barotrauma, tympanic rupture, inner-ear injury or alternobaric vertigo; distinguish from neurological decompression sickness.
Immersion pulmonary oedema	Acute dyspnoea, cough and hypoxaemia during or after immersion, often without aspiration; consider cardiac and pulmonary causes.
Delayed presentation	Symptoms can begin after an apparently normal interval or worsen after flying / altitude exposure. Improvement with oxygen does not exclude the need for recompression.

17.2 Immediate management and transfer

1. Give 100% oxygen by a well-sealed non-rebreather, demand valve or ventilator. Continue throughout assessment and transfer unless contraindicated.
2. Position comfortably, usually supine when tolerated. Protect the airway and use standard resuscitation for arrest or shock. Avoid unnecessary Trendelenburg positioning.
3. Establish IV access and give isotonic fluid when clinically dehydrated or hypotensive; avoid fluid overload. Treat hypoglycaemia, seizure and temperature problems.
4. Perform and document a detailed serial neurological examination, cardiopulmonary examination, ear assessment and full dive history: depth, duration, gas mix, ascent, stops, repetitive dives, altitude after diving and other divers affected.
5. Contact a diving-medicine / hyperbaric physician immediately. Arrange recompression-capable transfer based on clinical suspicion; do not delay for normal CT, MRI, chest radiography or laboratory tests.
6. Avoid nitrous oxide. Avoid air transport or choose the lowest practical cabin altitude in consultation with the hyperbaric and retrieval teams. Continue high-concentration oxygen.
7. Do not perform routine in-water recompression outside a specifically approved specialist protocol with trained personnel, equipment and evacuation contingency.
8. Treat pneumothorax before hyperbaric transfer when present. Manage barotrauma, trauma, drowning and hypothermia concurrently.

18. Acute altitude illness

Condition	Recognition and immediate management
Acute mountain sickness	Headache after recent ascent plus nausea, dizziness, fatigue or sleep disturbance. Stop ascent, rest, give analgesia / antiemetic, oxygen if available and consider acetazolamide under an approved pathway. Descend if symptoms worsen or do not improve.
High-altitude cerebral oedema	Ataxia, confusion, altered consciousness or focal deficit at altitude. Immediate descent is definitive; give oxygen and dexamethasone, use a portable hyperbaric chamber when descent is delayed, and arrange urgent evacuation.
High-altitude pulmonary oedema	Dyspnoea at rest, cough, reduced exercise tolerance, crackles, cyanosis or hypoxaemia. Immediate descent, oxygen, minimal exertion and urgent evacuation; consider nifedipine only under an approved pathway when descent / oxygen is limited.
ED after descent	Continue oxygen and supportive care, evaluate alternative cardiopulmonary / neurological diagnoses, obtain imaging and tests as indicated, and admit persistent hypoxaemia, pulmonary oedema or neurological dysfunction.

19. Special populations and contexts

Population / context	Additional safeguards
Children	Use age- and weight-based airway, fluids and medication. Children cool and warm rapidly and are vulnerable to hypoglycaemia. Consider non-accidental injury, supervision and safeguarding.
Pregnancy	Prioritize maternal oxygenation, temperature and circulation. Use left uterine displacement when indicated, involve obstetrics early, and provide fetal assessment according to gestational age. Do not withhold lifesaving imaging or treatment.
Older adults / frailty	Presentations may be subtle; assess medications, cognition, mobility, social isolation, infection, cardiovascular reserve and safe home environment. Use lower thresholds for observation and admission.
Cardiac / renal / pulmonary disease	Use cautious fluid and temperature management, monitor for heart failure / arrhythmia, and individualize oxygen / ventilatory support.
Athletes / military / workers	Document exertion, acclimatization, protective equipment, workload and occupational factors. Provide formal return-to-duty / sport review after heat stroke, electrical injury, decompression illness or significant exposure.
Mental-health or self-harm context	Treat medical threats first, preserve evidence when relevant, assess capacity and suicide risk after stabilization, and use the behavioural-emergency pathway.
Multiple casualties / disasters	Activate incident command, decontamination and surge plans. Apply triage principles specific to the event, including reverse triage after lightning when appropriate.
Remote / island setting	Contact retrieval, poison, hyperbaric and tertiary services early. Anticipate weather, aircraft cabin altitude, ferry / boat limitations, oxygen supply, cooling / warming continuity and escort competence.

20. Monitoring, reassessment, and deterioration

- Document a time-based trend of vital signs, mental status, oxygen requirement, ECG rhythm, core temperature, urine output, pain, neurovascular findings and treatment response.
- Reassess after every major intervention and at a frequency matched to acuity. Unstable or actively cooled / rewarmed patients require continuous monitoring and frequent senior review.
- Escalate immediately for worsening oxygenation, increased work of breathing, new crackles, hypotension, dysrhythmia, chest pain, seizure, focal deficit, reduced consciousness, oliguria, dark urine, rising CK / potassium, coagulopathy, hepatic injury, worsening tissue perfusion or recurrent temperature abnormality.
- Do not normalize one parameter in isolation. The goal is restoration of oxygenation, perfusion, neurological function, safe temperature trajectory, tissue viability and capacity for recovery without treatment-related harm.
- Use structured handover at every transition. Include exposure time, agent / environment, rescue and bystander care, decontamination, temperature trend, oxygen / ventilation, cooling / warming, tests, consultations, unresolved risks and contingency triggers.

21. Disposition, transfer, and discharge

Disposition	Minimum criteria / triggers
Resuscitation / ICU	Cardiac arrest, invasive ventilation, persistent hypoxaemia, shock, serious dysrhythmia, severe heat stroke, severe hypothermia, multiorgan injury, seizure, coma, significant inhalational exposure or need for continuous organ support.
Urgent specialist transfer	ECLS-rewarming candidate; decompression illness / gas embolism; deep frostbite requiring limb-salvage therapy; significant high-voltage / lightning injury; major chemical or radiation exposure; need for burn, vascular, trauma, neurology or hyperbaric care unavailable locally.
Monitored admission / observation	Persistent symptoms, abnormal ECG / oxygenation / temperature / laboratory results, rescue breathing or CPR, significant comorbidity, delayed-toxicity risk, uncertain exposure, unreliable follow-up or safeguarding concern.

Disposition	Minimum criteria / triggers
Discharge	Only after the syndrome-specific observation period, stable age-appropriate vital signs, normal or improving mental state and function, adequate oral intake / mobility, no unresolved respiratory or neurovascular concern, reliable supervision, clear follow-up and written return precautions.
Occupational / public-health follow-up	Chemical, radiation, workplace, cluster or reportable events require documentation, exposure register, appropriate notification and worker / public-health review.
Rehabilitation / prevention	Arrange burn / hand / neurology / audiology / ophthalmology / psychological / sports / diving follow-up and provide prevention counselling relevant to water, heat, cold, electricity, storms, diving and altitude.

22. Documentation, governance, and audit

- Record exact exposure and rescue timeline, scene hazards, PPE, decontamination, first and serial core temperatures, oxygen and ventilation, cooling / rewarming method, ECG, neurovascular findings, tests, treatment, specialist advice, transfer decision and discharge counselling.
- Complete occupational, public-health, radiation, hazardous-material, safeguarding and serious-incident reports when indicated. Preserve chain of custody for contaminated items or forensic evidence according to policy.
- Review deaths, cardiac arrests, unplanned intubations, delayed transfers, secondary staff contamination, failed decontamination, cooling / rewarming delays, missed decompression illness, unplanned readmission and limb loss through multidisciplinary governance.
- Maintain interagency drills for drowning, heat mass casualty, severe hypothermia, chemical contamination, radiation, lightning and diving emergencies. Include equipment deployment and transport continuity.
- Audit process and outcome measures at least annually and after major events; feed findings into training, stock levels, referral agreements and protocol revision.

Suggested indicator	Target / review question
Time from arrival to ventilation in apnoeic drowning	Immediate; review every delay.
Time to active cooling in suspected heat stroke	Cooling initiated immediately on recognition.
Cooling rate and stop temperature documented	Yes for every heat-stroke case.
Core temperature and rewarming method documented in hypothermia	Yes for every moderate / severe case.
ECLS / hyperbaric / poison / radiation specialist contact time	Documented when indicated; review avoidable delay.
Contaminated patient entering clean ED before decontamination	Zero unless lifesaving exception documented.
Repeat ECG / neurovascular / neurological assessment documented	Yes when syndrome requires serial assessment.
Written return precautions and prevention advice	Yes for every discharged patient.
Staff exposure or PPE breach	Zero; every event investigated.
Unplanned return / deterioration within 72 hours	Case review for selection, observation and communication failures.

23. Minimum equipment and readiness

Capability	Minimum readiness requirement
Resuscitation	Oxygen, suction, bag-mask devices, difficult-airway equipment, ventilator, defibrillator, capnography, IV / IO access, vasoactive infusion capability and paediatric sizes.
Temperature management	Rectal and low-reading core thermometers; cold-water immersion or tarp-cooling capability; ice / cold water; evaporative cooling; forced-air warmer; warming blankets; warmed IV fluid and safe heat packs.
Decontamination	Clearly marked external area, privacy screens, water supply / containment, soap, absorbent material, brushes for dry powder, bags / labels, eyewash, chemical-resistant PPE and incident-zone signage.

Capability	Minimum readiness requirement
Electrical / lightning	ECG, defibrillator pads, burn dressings, compartment / vascular assessment tools and access to CK / electrolyte testing.
Diving / hyperbaric	High-flow oxygen with non-rebreather and demand-valve options when available, sufficient oxygen for transfer, neurological examination form, dive-history form and 24-hour hyperbaric contact list.
Radiation	Radiation-safety contact list, survey capability through local agency, disposable PPE, contamination-control supplies, labeled waste containers and access to national guidance.
Transfer	Approved referral matrix, ECLS and hyperbaric destinations, transport altitude guidance, coast guard / air / sea contacts, escort standards and contingency oxygen / battery / warming / cooling supplies.
Training	Annual simulation for heat stroke, hypothermia, drowning and contaminated-patient reception; periodic interagency drills for chemical, radiation, diving and mass-casualty events.

24. References and evidence base

- American Heart Association. 2025 Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care: Special Circumstances of Resuscitation, including drowning, environmental hypothermia, life-threatening hyperthermia, lightning and electrical injury.
- American Heart Association and American Academy of Pediatrics. 2024 Focused Update on Resuscitation Following Drowning.
- Wilderness Medical Society. Clinical Practice Guidelines for the Treatment and Prevention of Drowning: 2024 Update.
- Wilderness Medical Society. Clinical Practice Guidelines for the Prevention and Treatment of Heat Illness: 2024 Update.
- Society of Critical Care Medicine. Guideline for the Treatment of Heat Stroke, 2025.
- Wilderness Medical Society. Clinical Practice Guidelines for the Out-of-Hospital Evaluation and Treatment of Accidental Hypothermia, 2019 Update.
- Wilderness Medical Society. Clinical Practice Guidelines for the Prevention and Treatment of Frostbite: 2024 Update; and Nonfreezing Cold Injuries: 2023 Update.
- Wilderness Medical Society. Clinical Practice Guidelines for the Prevention and Treatment of Lightning Injuries, 2014 Update.
- Wilderness Medical Society. Clinical Practice Guidelines for the Prevention and Treatment of Acute Altitude Illness: 2024 Update.
- World Health Organization. Initial Clinical Management of Patients Exposed to Weaponized Chemicals: Interim Guidance, June 2026.
- US Department of Health and Human Services. Chemical Hazards Emergency Medical Management / PRISM guidance for mass-casualty decontamination and chemical emergencies.
- International Atomic Energy Agency. Medical Management of Radiation Injuries, EPR-Medical, 2024; and national radiation-emergency medical guidance.
- Undersea and Hyperbaric Medical Society. Hyperbaric treatment guidance and consensus recommendations for decompression illness and arterial gas embolism.
- Local policies for resuscitation, trauma, burns, toxicology, decontamination, radiation incidents, occupational exposure, public-health notification, hyperbaric referral, critical-care transfer and discharge.

Annex 1. One-page environmental emergency workflow

Step	Action
1. Protect	Scene safe? Contamination? Electricity? Water rescue? Confined space? PPE and incident command before contact.
2. Stabilize	ABCDE, glucose, core temperature, oxygen / ventilation, ECG / defibrillator, IV / IO, trauma and seizure care.
3. Treat the exposure	Drowning: ventilate. Heat stroke: cool. Hypothermia: handle gently and rewarm. Chemical: decontaminate. Electrical / lightning: resuscitate and assess deep injury. Diving: 100% oxygen and hyperbaric call.
4. Measure and trend	Temperature, mental state, oxygenation, rhythm, blood pressure, urine output, neurovascular findings, CK / renal / liver / coagulation as indicated.
5. Call early	ICU, trauma / burn, poison / HazMat, radiation safety / public health, ECLS centre, diving / hyperbaric service, retrieval.

Step	Action
6. Reassess	After each intervention and at syndrome-specific intervals. Look for respiratory, neurological, cardiac, renal, hepatic, coagulation and tissue deterioration.
7. Disposition	Admit / transfer if organ injury, instability, delayed-risk exposure or unreliable follow-up. Discharge only after safe observation, functional recovery and written advice.
8. Learn	Complete required notifications, exposure records, staff-safety reports and serious-incident review.

Annex 2. Drowning assessment and observation record

Item	Document
Event	Submersion / immersion time; witnessed? water type / temperature; rescue method; trauma mechanism; time removed.
Resuscitation	Apnoea / pulse status; rescue breaths; CPR; AED / shocks; ROSC time; oxygen / airway; hypothermia.
Arrival	GCS; respiratory rate / effort; SpO2 and oxygen; chest findings; temperature; BP / pulse; glucose; trauma survey.
Treatment	Oxygen / NIV / intubation; ventilation settings; warming; fluids / vasoactive; seizure treatment; antibiotics indication.
Serial review	Time, SpO2 on stated oxygen, respiratory exam, mental state, temperature, exertional tolerance and clinician decision.
Disposition	Admission / transfer reason or discharge criteria met; supervision, prevention advice and return precautions.

Annex 3. Heat-stroke cooling record

Required field	Entry
Recognition time / setting	_____
Initial mental state / core temperature / glucose	_____
Cooling start time	_____
Method	Immersion / tarp / evaporative-convective / other: _____
Temperature trend	Time: _____ Temp: _____ | Time: _____ Temp: _____ | Time: _____ Temp: _____
Cooling rate	_____ C per minute
Cooling stop time / temperature	_____
Fluids / benzodiazepine / airway support	_____
Serial organ-injury tests	Renal / CK / liver / coagulation / glucose / sodium / lactate: _____
Disposition / receiving service	_____

Annex 4. Hypothermia and rewarming record

Required field	Entry
Exposure / wet / wind / immersion / trauma	_____

Required field	Entry
Initial clinical stage	Consciousness: _____ Shivering: _____ Cardiovascular stability: _____
Core temperature and method	_____
Handling / insulation	Horizontal / wet clothes removed / dry insulation / trunk warming: _____
Airway / oxygen / warmed fluids	_____
Rewarming method and start time	_____
Temperature trend	Time: _____ Temp: _____ | Time: _____ Temp: _____ | Time: _____ Temp: _____
Rhythm / BP / glucose / potassium	_____
ECLS centre contacted / HOPE score if used	_____
Transfer plan	Destination: _____ Mode: _____ Warming continuity: _____

Annex 5. Electrical and lightning checklist

Check	Complete / finding
Power / storm scene confirmed safe	_____
Voltage / source / AC-DC / wetness / current path	_____
Loss of consciousness / arrest / CPR / defibrillation	_____
12-lead ECG and continuous monitoring indication	_____
Full trauma and burn examination	_____
Neurovascular / compartment findings	_____
CK / renal / electrolytes / urinalysis indicated	_____
Eye / ear / neurological examination after lightning	_____
Pregnancy assessment / fetal monitoring	_____
Admission / discharge criteria and follow-up	_____

Annex 6. Chemical / radiological decontamination checklist

Check	Complete / finding
Incident command and zones established	_____
Agent / source / SDS / radiation information obtained	_____
Correct PPE selected and buddy check completed	_____
Lifesaving intervention performed safely	_____
Clothing / jewelry removed, bagged and labeled	_____
Dry decontamination before water when indicated	_____
Skin / eye irrigation method, start and stop times	_____
Runoff / waste / contaminated equipment controlled	_____
Poison / HazMat / radiation safety / public health contacted	_____
Staff exposure / PPE breach documented	_____

Check	Complete / finding
Patient cleared for clean ED entry	By: _____ Time: _____

Annex 7. Diving-emergency record

Domain	Document
Dive profile	Date / location; maximum depth; bottom time; breathing gas; ascent rate; decompression stops; repetitive dives.
After dive	Time symptoms began; flight / altitude; exertion; alcohol / dehydration; other divers affected.
Symptoms	Pain, skin, balance, weakness, numbness, bladder, vision, cognition, seizure, dyspnoea, chest pain, ear / sinus symptoms.
Examination	Full serial neurological examination, gait, coordination, sensation, strength, cranial nerves, lungs, ears and skin.
Treatment	100% oxygen start time and device; IV fluid; airway; seizure / shock treatment; pneumothorax management.
Hyperbaric contact	Service / physician / time / advice / receiving facility.
Transfer	Mode, cabin altitude / route, oxygen supply, escort, contingency and estimated arrival.

Annex 8. Specialist transfer and handover checklist

- Patient identifiers, age / weight, pregnancy status, comorbidities, allergies and baseline function.
- Exposure type, exact timing, duration, rescue, scene hazards and decontamination status.
- Cardiac arrest / CPR / ROSC, airway, oxygen, ventilation, temperature trend, cooling / rewarming and fluids.
- Neurological, respiratory, cardiac, skin and neurovascular findings with serial change.
- ECG, laboratory and imaging results; pending tests; urine output and fluid balance.
- Specialist advice, indication for transfer and anticipated intervention: ECLS, hyperbaric recompression, burn / vascular care, toxicology, radiation or critical care.
- Transport hazards: altitude, oxygen duration, heat / cold exposure, contamination, need for isolation, battery / medication / blood supply.
- Named accepting clinician, destination, escort competence, treatment ceilings, deterioration plan and family communication.

Annex 9. Minimum discharge instructions

Exposure	Return immediately for
Drowning	Breathlessness, worsening cough, chest pain, fever, confusion, blue colour, fainting or reduced activity.
Heat illness	Confusion, fainting, vomiting, reduced urine, dark urine, muscle pain, jaundice, bleeding or recurrent high temperature.
Cold injury	Increasing pain, swelling, blisters, colour change, numbness, fever, drainage or reduced movement.
Electrical / lightning	Chest pain, palpitations, fainting, weakness, worsening pain / swelling, dark urine, hearing / vision change or confusion.
Chemical / radiation	Breathing difficulty, eye pain, skin blistering, vomiting, confusion, fever, bleeding or instructions from public-health / radiation teams.
Diving / altitude	Weakness, numbness, imbalance, confusion, bladder difficulty, chest pain, breathlessness, cough or symptom recurrence after improvement.

Every discharge must also include medication instructions, wound / skin care when relevant, hydration and activity advice, follow-up date and location, emergency contact information, supervision requirements, occupational / sport / diving restrictions, and a clear statement not to fly, dive, reascend or return to hazardous work until medically cleared when applicable.

Annex 10. Local configuration checklist

Local element	Complete before approval
24-hour poison-centre / toxicology contact	Name / number: _____
ECLS-capable hypothermia centre	Name / number / transfer trigger: _____
Hyperbaric / diving-medicine service	Name / number / transport route: _____
Burn / frostbite / vascular / hand referral service	Name / number: _____
Radiation-safety officer / national radiation authority	Name / number: _____
HazMat / fire / public-health incident contacts	Names / numbers: _____
Cooling equipment location and deployment drill	_____
Core thermometry and rewarming equipment	_____
External decontamination area, runoff and PPE plan	_____
Transport altitude and oxygen-continuity policy	_____
Approved medication / antidote / countermeasure doses	Document / version: _____
Observation and discharge criteria approved	Document / version: _____
Staff training and simulation schedule	_____
Governance owner and next review date	_____